



December 2011

## Sci-Tech Book News Reviews

Susan Fingerman

Follow this and additional works at: <http://jdc.jefferson.edu/scitechnews>

 Part of the [Physical Sciences and Mathematics Commons](#)

[Let us know how access to this document benefits you](#)

### Recommended Citation

Fingerman, Susan (2011) "Sci-Tech Book News Reviews," *Sci-Tech News*: Vol. 65: Iss. 4, Article 13.

Available at: <http://jdc.jefferson.edu/scitechnews/vol65/iss4/13>

This Article is brought to you for free and open access by the Jefferson Digital Commons. The Jefferson Digital Commons is a service of Thomas Jefferson University's [Center for Teaching and Learning \(CTL\)](#). The Commons is a showcase for Jefferson books and journals, peer-reviewed scholarly publications, unique historical collections from the University archives, and teaching tools. The Jefferson Digital Commons allows researchers and interested readers anywhere in the world to learn about and keep up to date with Jefferson scholarship. This article has been accepted for inclusion in *Sci-Tech News* by an authorized administrator of the Jefferson Digital Commons. For more information, please contact: [JeffersonDigitalCommons@jefferson.edu](mailto:JeffersonDigitalCommons@jefferson.edu).

## Sci-Tech Book News Reviews Susan Fingerman, Selector



The following section consists of 100 book reviews selected from *Sci-Tech Book News*, reprinted with the permission of Book News Inc. This review journal is published four times a year, each issue reviewing over 2,000 new titles in the physical and biological sciences, mathematics, engineering, computer science, technology, and agriculture. For a sample issue and subscription information, contact Book News Inc. at 5739 NE Sumner Street, Portland, OR 97218. Phone: (503)281-9230; Fax: (503)287-4485; E-mail: [booknews@booknews.com](mailto:booknews@booknews.com).

### GEOGRAPHY

G70 2011-012049 978-0-415-80483-7

**Advances in web-based GIS, mapping services and applications.**

Title main entry. Ed. by Songnian Li et al. (ISPRS book series; v.9)

*CRC Press*, ©2011 385 p. \$159.95

The processes of designing, implementing, generating, and delivering maps, geospatial data, and Geographical Information Systems' (GIS) functionality or services on the web are examined by contributors from the underlying sciences, from areas of application, and from the computer systems that connect the two. They address the overall issues of constantly updating related web and geospatial technologies as well as innovations in web mapping caused by mainstream information technology vendors such as Google and Yahoo, increased interest in geospatial information technologies from business, and increasing demand from the general public for prompt and effective online access to geospatial information.

G70 978-1-58948-242-5

**Understanding GIS; an ArcGIS project workbook. (DVD-ROM included)**

Harder, Christian et al.

*Esri Press*, ©2011 360 p. \$79.95 (pa)

This workbook for GIS (geographic information system) students and professionals illustrates the methods, tools, and processes needed to apply full-scale GIS analysis to a spatially-based problem. It contains a nine-lesson project in which readers assume the role of a GIS analyst who must find the best location for a new park along the Los Angeles River, providing the starting data (on the DVD) and guidance for performing a complete GIS analysis and exploring the study area; building a database; evaluating, processing, editing, and analyzing the data; modeling alternative outcomes; mapping

findings; and sharing results on interactive web maps. It includes instruction on the use of ArcGIS Desktop 10 software within the project.

GE45 2011-004906 978-1-906799-04-5

**Practical environmental statistics and data analysis.**

Title main entry. Ed. by Yue Rong. (Advanced topics in environmental science series)

*ILM Publications*, ©2011 269 p. \$105.00

Rather than a math book, this work is a practical statistics guide for policy makers, planners, regulators, and those working in environmental science. Focusing on statistics as a means to solve problems in a variety of environmental fields, the book describes statistical methods used in environmental research, problem-solving, and decision making in areas such as groundwater monitoring, transport in environmental systems, and environmental forensics. Coverage includes applications of statistics in earthquake hazard prediction, adaptive sampling of ecological populations, solving complex environmental problems using stochastic data analysis, and statistical accounting for uncertainty in modeling transport in environmental systems. There are also chapters on petroleum hydrocarbon forensic data and cluster analysis, and anomaly detection methods for hydrologists, hydrogeologists, and environmental engineers. A section of color charts is included. International contributors come from academia, industry, and public entities. Rong is the environmental program manager at the Los Angeles Regional Water Quality Control Board of the California Environmental Protection Agency. Distributed by Cold Spring Harbor Laboratory Press.

GE195 2011-0504 978-1-4398-4928-6

**Fundamentals of practical environmentalism.**

Weldon, Mark B.

*CRC Press*, ©2011 201 p. \$79.95

Drawing on some 20 years of professional engineering experience, resource conservation

engineer Weldon (PepsiCo, Cedar Rapids, Iowa) introduces readers to a valuable tool for improving their daily interactions with the environment. Written for activists, policymakers, researchers, resource managers, government agencies, and students, the text opens with an overview of practical environmentalism and its four main components<-->environmental degradation, resource conservation, economic progress, and personal benefit<-->followed by a concise history of environmentalism in the US, environmentalism ethics, and elements that make environmental decision making difficult. Subsequent chapters explain each of the components in detail, including their combination into a holistic metric to guide environmental actions. Using real-world examples, Weldon demonstrates use of the metric to conduct practical and meaningful analyses of environmental issues and actions, both the individual and large scale.

## ECONOMICS

HB61 2011-009721 978-0-8389-1024-5

### **ALA guide to economics & business reference.**

Title main entry. Ed. by American Library Association.

*Am. Library Association*, ©2011 505 p. \$65.00 (pa)

Compiled in North America for use primarily in North American libraries serving higher education institutions, this reference guide will also be of value to public and school librarians, independent researchers, publishers, book dealers, and librarians in North America and beyond. It contains annotated bibliographies for some 1400 print and electronic sources that are key to economics and business reference. The entries are grouped into eight topical chapters: basic industry information, company information, economic conditions and world trade, functional areas of business, general works, occupations and careers, regional economic sources, and specialized industry information. Each chapter is further organized into multiple subcategories; entries are organized alphabetically within the subcategories. The entries include the traditional array of encyclopedic, bibliographic, and compendious works, as well as websites, search engines, and full-text databases.

HB615 978-1-4398-5763-2

### **Primer on risk analysis; decision making under uncertainty.**

Yoe, Charles.

*CRC Press*, ©2012 237 p. \$59.95 (pa)

Intended as a primer for students or practitioners,

this book by You (economics, College of Notre Dame of Maryland) explores risk assessment and management under the standard situation of uncertainty. This book also has a section on risk communication which covers honest public relations focused on two way interaction. The language of risk analysis still varies depending on the organization, and the author both chooses to standardize the terms used in his writing and also to present in an appendix the official language of the International Organization for Standardization (ISO). Examples of relations with government agencies, such as the Food and Drug Administration or the Department of Homeland Security, are limited to the United States.

## PRODUCTION, INDUSTRY, LABOR

HD30 2011-014967 978-1-60960-605-3

### **International enterprises and global information technologies; advancing management practices.**

Title main entry. Ed. by Felix B. Tan.

*Information Science Reference*, ©2011 390 p. \$180.00

International contributors in management and computer information systems offer insight on the use of technology in business and industry, in this book for managers, IT professionals, and business students. The first section of the book introduces governance, trends, and terminology related to the latest information technology, and examines the influence of national and organizational cultures on technology use. The second section offers international cases on different sectors, in areas such as user evaluation of e-government systems in China, compliance with government regulation of IT in South Africa, use of instant messaging in Kuwait, and Korean mobile Internet use. The book's third section looks at trends and techniques, such as management of knowledge transfer in offshore software development. Tan is professor of information systems and director of the Center for Research on Information Systems Management at Auckland University of Technology, New Zealand.

HD30 2011-017262 978-1-55570-720-0

### **Knowledge management; an introduction.**

Desouza, Kevin C. and Scott Paquette.

*Neal-Schuman*, ©2011 351 p. \$80.00 (pa)

Information scholars Desouza (U. of Washington) and Paquette (U. of Maryland) offer a textbook introducing graduate and upper-level undergraduate students to fundamentals of managing information

that can be applied in any type and size of organization. Information management courses are taught in several disciplines ranging from library science to engineering. There are no prerequisites. Within sections on the basics, processes, and building programs, they consider such aspects as the concept of knowledge, knowledge transfer, and building the business case for knowledge management.

HD30 2011-012048 978-1-4200-7860-2

**Lean management principles for information technology.**

Plenert, Gerhard J. (Series on resource management)

*CRC Press*, ©2012 344 p. \$79.95

Plenert, who works in information technology quality and productivity consulting and has experience in manufacturing, planning and scheduling methods, explains how to introduce and implement lean principles in information technology functions in settings ranging from the commercial sector to government to reduce or eliminate waste and increase efficiency. He discusses Six Sigma, cycle time, value stream mapping, value-added vs. non-value-added activities, bottlenecks, and spaghetti charting. Coverage also includes the need for IT to become more efficient, an overview of change management and how it works, and exploration of IT and the need for improvements. He details a methodology for analyzing problems and processes and overviews continuous process improvement alternatives, then describes how lean can be used, along with metrics to determine if success and improvement was achieved. He ends with a section on assessing an organization's IT maturity, the next generation of lean and its application, and how it can drive IT in the future.

HD30 2011-018830 978-981-4335-58-4

**Multiple criteria decision making; from early history to the 21st century.**

Köksalan, M. Murat et al.

*World Scientific*, ©2011 197 p. \$72.00

For students, academics, and professionals in the field of decision sciences, Köksalan (multiple criteria decision making, Middle East Technical U., Turkey) et al. recount the history of multiple criteria decision making (MCDM) in the field of management sciences and operations research, from its early history and roots to the 1960s, and through each subsequent decade up to the present. They cover contributors, contributions, and subfields such as decision analysis, goal programming, the work of the "French School," which includes outranking relations, multiple objective

mathematical programming, fuzzy set theory, the analytic hierarchy process, and evolutionary multiobjective optimization. They also highlight International Society on Multiple Criteria Decision Making conferences and traditions, its awards, and presidents, and provide biographies of leading scholars in the field, with photos.

HD69 978-1-4398-5246-0

**Managing projects in trouble; achieving turnaround and success.**

Kliem, Ralph L.

*CRC Press*, ©2011 196 p. \$69.95

Over 25-plus years of experience in a corporate environment, project management consultant Kliem has discovered how to successfully manage projects, in general, and five keys to effectively turning around troubled ones. In this text, he offers project management professionals an overview of project management and the symptoms and patterns of troubled projects, followed by chapters on each of the five strategies: *energizing* the project by motivating the existing team members to make needed changes; *envisioning* the project by revisiting the original vision and developing a new or revised vision; *exploring* all the options available to execute the new or revised vision; *evaluating* those options to choose the best one(s) to implement; and implementing solid management concepts, tools, techniques, and methods to *execute* a new or revised vision of the project.

HD69 2011-016833 978-1-4398-5111-1

**Program management complexity; a competency model. (CD-ROM included)**

Levin, Ginger and J. LeRoy Ward. (ESI international project management series)

*CRC Press*, ©2011 203 p. \$69.95

The authors, credentialed as "Program Management Professionals" by the Project Management Institute, offer their advice on managing complexity in programs across industries and provide information on the set of competencies that is required to be a successful program manager. They begin with a literature review of program and project management complexity and then present a competency model for program managers that addresses the performance competencies of defining, initiating, planning, executing, monitoring and controlling, and closing the program and the personal competencies of communicating, leading, building relationships, negotiating, thinking critically, facilitating, mentoring, and embracing change. They also include assessment instruments for assessing one's own competencies. The CD-



ROM appears to just reproduce the model and the assessment instruments in electronic form.

HD9502 2010-934014 978-1-84844-551-2

**The handbook of research on energy entrepreneurship.**

Title main entry. Ed. by Rolf Wüstenhagen and Robert Wuebker.

*Edward Elgar Publishing*, ©2011 384 p. \$210.00

The process of assembling this collection of articles further convinced editors Wüstenhagen (renewable energies management, U. of St. Gallen, Switzerland) and Wuebker (entrepreneurship and strategy, U. of Utah, US) that in addition to scholarly benefits, "...understanding the drivers of entrepreneurial activity in the emerging new energy sector (along with exploring the specific challenges faced by energy entrepreneurs) has tremendous practical relevance." Contributions are arranged under the broad themes of the role of start-up firms, international energy entrepreneurship, large incumbent firms, financing, commercializing energy innovation, and institutions and public policy.

HD9685 978-1-60807-127-2

**The advanced smart grid; edge power driving sustainability.**

Carvallo, Andres and John Cooper.

*Artech House*, ©2011 237 p. \$89.00

Carvallo and Cooper describe how they built a smart electric power grid for the Austin, Texas power company, which they expect to be the first of many. They focus on the new power engineering concepts needed to drive the transition to a more rational approach to designing and operating an advanced smart grid. They discuss the inevitable emergence of the smart grid, the rationale for an advanced smart grid, smart convergence, smart grid 1.0 emerges, envisioning and designing smart grid 2.0, today's smart grid, and fast-forward to smart grid 3.0. No deep technical background is assumed.

---

**SCIENCE (GENERAL)**

---

Q325 2010-046375 978-0-470-34396-8

**Self-adaptive systems for machine intelligence.**

He, Haibo.

*John Wiley & Sons*, ©2011 230 p. \$84.95

This comprehensive introduction to machine intelligence engineering and self-adaptive systems provides an overview of a variety of processes and technologies for the development of artificial intelligence. The volume

includes discussion of incremental learning, imbalanced learning, ensemble learning, adaptive dynamic programming, associative processes, sequence learning and hardware design for machine intelligence. Chapters include numerous illustrations, formulas and data tables as well as a glossary of terms, acronyms and abbreviations. He is a professor of engineering at the University of Rhode Island.

---

**MATH, COMPUTERS**

---

QA76.54 2011-016061 978-1-60960-827-9

**Achieving real-time in distributed computing; from grids to clouds.**

Title main entry. Ed. by Dimosthenis P. Kyriazis et al.

*Information Science Reference*, ©2012 330 p. \$195.00

This collection of fifteen articles on distributed computing showcases current scholarship in cloud computing and a wide variety of online services. Divided into sections covering software as a service, infrastructure as a service, and platforms as a service, individual articles discuss such topics as programming interfaces and IDEs for real-time and cloud based computing, data storage in cloud based environments and workflow management systems in distributed computing. Papers include abstracts, illustrations, code examples and references and a volume-wide compilation of reading resources is provided. Contributors include computer scientists and academics from European institutions.

QA76.575 2011-001669 978-0-470-74700-1

**Multimedia semantics; metadata, analysis and interaction.**

Troncy, Raphaël et al.

*John Wiley & Sons*, ©2011 305 p. \$115.00

Researchers in multimedia, information, and other fields address issues relating to representing and managing the multimedia data that is increasingly being acquired, created, stored, sent, edited, browsed, and rendered on devices ranging from desk computers to mobile phones. They gather and report on recent work that aims to extract and represent the semantics of multimedia items, focusing particularly on what is called the semantic gap: between the low-level descriptors that can be computed automatically from multimedia content, and the richness and subjectivity of semantics in user queries and human interpretations of audio-visual media.

QA76.58 2011-017261 978-1-55570-749-1

**Getting started with cloud computing; a LITA guide.**

Title main entry. Ed. by Edward M. Corrado and Heather Lea Moulaison. (LITA guide; #16)

*Neal-Schuman*, ©2011 214 p. \$65.00 (pa)

Cloud computing, in which data is centrally stored, is introduced as enabling libraries to focus on their mission and services rather than on peripheral technical issues. In this Library and Information Technology Association guide, Corrado (library technology, Binghamton U., New York ) and Moulaison (information science and learning technologies, U. of Missouri) compile 20 chapters for librarians and computer professionals working in libraries on how cloud computing relates to their environment. Contributors discuss general issues, technologies, and case studies of library usage of cloud computing. Illustrations feature service sign-in forms, data flows, and cost comparisons of cloud platforms.

QA76.585 2011-012004 978-1-59749-592-9

**Securing the cloud; cloud computer security techniques and tactics.**

Winkler, Vic J.R.

*Syngress Media, Inc.*, ©2011 290 p. \$59.95 (pa)

This comprehensive guide to security concerns and best practices for cloud computing and cloud services provides practical advice for assessing security risks in remote infrastructure and applications and implementing security standards both in the design of new cloud products and the use of existing services. Topics discussed include cloud computing architectures, risk issues and legal topics, data security, internal and external clouds, information security frameworks and operational guidelines. Chapters include summaries, numerous illustrations and organizational charts, tables and sidebars. Winkler works for Booz Allen Hamilton, a security consulting firm working for the US government.

QA76.5915 2011-002202 978-0-470-74772-8

**Pervasive computing and networking.**

Title main entry. Ed. by Mohammad S. Obaidat et al.

*John Wiley & Sons*, ©2011 322 p. \$105.00

This collection of nineteen articles on pervasive computing highlights current scholarship in a wide variety of technologies related to ubiquitous systems and networks. Topics discussed include resource and service discovery in mobile computing, dynamic reconfiguration, opportunistic networking, standards implementation, smart systems and intelligent environments and adaptive architecture and ad hoc performance evaluations. Individual papers include illustrations, tables and code examples. The contributors are hardware and software engineers and

academics in computing and informatics related fields from universities around the world.

QA76.76 2011-014858 978-0-13-258220-9

**The economics of software quality.**

Jones, Capers and Olivier Bonsignour.

*Addison-Wesley*, ©2012 587 p. \$79.99

Intended for software testing professionals as well as other stake holders in the development process, this volume seeks to quantify the costs and value of software testing in order to provide a solid footing for both business and technological decision making. Beginning with definitions of software testing processes and economic value, the work discusses estimating and measuring software quality, defect prevention, pre-test defect removal, post-release defect removal and economic analysis of the testing and remediation processes. Jones is the CEO of a software company and Bonsignour is an experienced software developer and tester.

QA76.76 2011-014614 978-1-60960-762-3

**Handbook of research on practices and outcomes in virtual worlds and environments; 2v.**

Title main entry. Ed. by Harrison Hao Yang and Steve Ci-Yin Yuen.

*Information Science Reference*, ©2012 755 p. \$495.00

This two-volume set introduces theoretical aspects of virtual worlds and describes current and future trends in the design of virtual worlds. The book's international contributors come from diverse fields, such as educational technology, computer science, and industrial engineering. In the first part of the book, they ponder ethical considerations for the design and development of virtual worlds, learning games, and simulations, and address the problem of virtual hate communities. The second section looks at applications of virtual communities, such as virtual museums, virtual evidence in the courtroom, and cyber charter schools. Chapters on professional development and pedagogical design examine teacher professional development, virtual worlds as environments for spatial reasoning, and instructor feedback in online learning. The book's final set of chapters gives examples of program practices, such as e-portfolios in reflective learning and commerce models in virtual worlds. B&w screenshots are included in a two-column format. The book is written for a broad audience of practitioners, managers, trainers, and researchers in business and education. It can also be used in courses in information or

instructional technology. Yang teaches in the Department of Curriculum and Instruction at State University of New York-Oswego. Yuen teaches the Department of Technology Education at The University of Southern Mississippi.

QA76.9 2011-012243 978-1-84821-250-3

**Distributed systems; design and algorithms.**

Title main entry. Ed. by Serge Haddad et al.

*ISTE/Wiley*, ©2011 334 p. \$145.00

Researchers mostly from France but also the lowlands and Chile explain distributed systems to engineers, masters students, or others familiar with algorithms and programming. They present distributed systems in relation to their design and their main principles. The overall themes and large-scale peer-to-peer distributed systems; distributed, embedded, and real-time systems; and security in distributed systems. Among the topics are design principles of large-scale distributed systems, peer-to-peer storage, scheduling in distributed real-time systems, the design of aerospace systems, practical security in distributed systems, and enforcing security with cryptography.

QA76.9 2010-281555 978-981-283-703-5

**Handbook of electronic security and digital forensics.**

Title main entry. Ed. by Hamid Jahankhani et al.

*World Scientific*, ©2010 697 p. \$252.00

While the knowledge explosion due to information and communications technology (ICT) has yielded substantial benefits, the darkside of ICT is escalating in the form of cybercrime. Jahankhani (U. of East London, UK) and other researchers and practitioners in the field of electronic security and digital forensics present a state-of-the-art review of the risks, issues, and practices involved in electronic information security. Following an introduction to principles for protecting computer operating systems and networks, contributors to 33 chapters discuss topics including authentication, security measures specifically for wireless networks, developing secure-by-design information systems, behavioral biometrics, and other risk management strategies. They also treat how to protect national critical information infrastructures against cyber attacks, and intelligent decision support systems for forensic investigations. Diagrams illustrate the frameworks and processes discussed.

QA76.9 2011-005844 978-0-12-372512-7

**Heuristic search; theory and applications.**

Edelkamp, Stefan and Stefan Schrödl.

*Morgan Kaufmann Pub., Inc.*, ©2012 836 p.

\$89.95

This is an introduction to artificial intelligence heuristic state space search. Authors Edelkamp (U. of Bremen, Germany) and Schrödl (a research scientist at Yahoo! Labs) seek to strike a balance between search algorithms and their theoretical analysis, on the one hand, and their efficient implementation and application to important real-world problems on the other, while covering the field comprehensively from well-known basic results to recent work in the state of the art. Prior knowledge of artificial intelligence is not assumed, but basic knowledge of algorithms, data structures, and calculus is expected. Proofs are included for formal rigor and to introduce proof techniques to the reader. They have organized the material into five sections: heuristic search primer, heuristic search under memory constraints, heuristic search under time constraints, heuristic search variants, and applications.

QA280 2011-012246 978-1-84821-277-0

**Digital spectral analysis; parametric, non-parametric and advanced methods.**

Title main entry. Ed. by Francis Castanié. (Digital signal and image processing)

*ISTE/Wiley*, ©2011 383 p. \$145.00

This reference for students, engineers, and academics covers all aspects of digital spectral analysis. Part 1 deals with processing tools and spectral analysis, offering chapters on areas such as classes of signals, representation of signals, spectral analysis, and digital signal processing. This section also offers an introduction to estimation theory with an application to spectral analysis time-series models. Part 2 covers non-parametric methods used most often in industry, and part 3 covers parametric methods such as spectral analysis by parametric modeling and minimum variance. A chapter on subspace-based estimators includes an application to partially known signal subspaces. Part 4 treats advanced concepts such as multidimensional harmonic retrieval, spectral analysis of non-stationary random signals, space-time adaptive processing, and particle filtering and tracking of varying sinusoids. Castanié directs the Research Laboratory in Telecommunications for Space and Aeronautics in France.

QA280 2010-048281 978-0-470-54064-0  
**Time series analysis and forecasting by example.**

Bisgaard, Soren and Murat Kulahci. (*Wiley series in probability and statistics*)

John Wiley & Sons, ©2011 366 p. \$125.00

Technology management scholar (U. of Massachusetts-Amherst) Bisgaard (1938-2010) and Kulahci (statistics, Technical U. of Denmark) found that many students and practitioners in statistics get frustrated trying to learn time series analysis, and either give up on it entirely or just plug data into a software package and accept what comes out. They set out to provide an introduction that is easy to understand and use, and that draws heavily from examples to demonstrate the principles and techniques. The profession of statistics needs at least a few people who know what is actually going on, they say, and who know the shortfalls of the statistical techniques being used.

---

## ASTRONOMY

---

QB462 2011908774 978-1-58381-768-1  
**Numerical modeling of space plasma flows; proceedings.**

International Conference on Numerical Modeling of Space Plasma Flows (5th: 2010: San Diego, CA) Ed. by Nikolai V. Pogorelov et al. (Astronomical Society of the Pacific conference series; v.444)

*Astronomical Soc./Pacific*, ©2011 300 p. \$77.00

At a level suitable for graduates, researchers, and practitioners in space physics, astrophysics, numerical engineering, and applied mathematics, 44 papers look at turbulence and cosmic ray transport; astrophysical flows; space plasma flows; kinetic, particle, and hybrid simulations; numerical methods, algorithms, and frameworks; and data handling and visualization. Among specific topics are quantifying uncertainty for turbulent mixing simulations, simulating relativistic shocks and associated radiation from turbulent magnetic fields, the effects of sun rotation on solar wind propagation, the effect of pitch angle scattering on the formation of the interstellar boundary explorer ribbon in the outer heliosheath, coupling kinetic and hydrodynamic models for simulating gas flows and weakly ionized plasmas, and petascale global kinetic simulations of the magnetosphere and visualization strategies for analyzing very large multi-variate data sets. There is no subject index.

QB500 2011927102 978-0-7695-4446-5  
**Space mission challenges for information technology; proceedings.**

IEEE International Conference on Space Mission Challenges for Information Technology (4th: 2011: Palo Alto, CA)

*Computer Society Press*, ©2011 200 p. \$188.00 (pa)

The conferences are intended as an interface between the community that designs, develops, and operates space missions and the community of software, computing, and other information-technology practitioners who represent emerging capabilities of relevance and importance to space missions. The 24 papers here cover reliable software, autonomy and automation, cybersecurity and networks, small spacecraft and systems, reliable/software systems, autonomy and robotics, mission operations, and vision and human systems. Among specific topics are the case for software health management, a new approach to autonomous onboard mission replanning using orthogonal array design, programming models and development software for a space-based many-core processor, human-rating for automated and robotic systems, transforming the operations paradigm of space exploration, and large terrain modeling and visualization for planets. Only the authors are indexed.

---

## PHYSICS

---

QC176 2010-050670 978-1-4398-1537-3  
**Optical techniques for solid-state materials characterization.**

Title main entry. Ed. by Rohit P. Prasankumar and Antoinette J. Taylor.

*CRC Press*, ©2012 718 p. \$129.95

Physicists and other scientists describe both basic and advanced experimental optical techniques that are commonly used to study materials. The goal is to provide enough information that researchers with different levels of experience can build and/or use a working setup, acquire data on both simple and complex materials, and analyze and interpret the data to obtain insight into fundamental material properties with minimal reliance on other sources. The topics include semiconductors and their nanostructures, carrier dynamics in bulk semiconductors and metals after ultra-short pulse excitation, time-resolved magneto-optical spectroscopy, near-field scanning optical microscopy, and recent developments in spatially and temporally resolved optical characterization of solid-state materials.



QC176 978-3-527-40894-8

**Properties of interacting low-dimensional systems.**

Gumbs, Godfrey and Danhong Huang.

Wiley-VCH, ©2011 379 p. \$115.00

Physicists Gumbs (City U. of New York-Hunter College) and Huang (US Air Force Research Laboratory) introduce methods and other information for conducting or understanding research at the mesoscopic scale--between the quotidian and the atomic--where dwell such species as semiconductor heterojunctions, quantum dots and wires, carbon nanotubes, and atomic layers of graphene. Neither traditional physics nor single-particle Schrödinger equations quite work here. The material is inspired by a lecture course they gave for many years to graduate students who had some background in basic quantum mechanics, statistical mechanics, and introductory solid state physics at the undergraduate level. It differs from similar textbooks by presenting a broad range of special topics as well as core chapters.

QC670 2011-011086 978-0-8218-5289-7

**Mathematical and statistical methods for imaging; proceedings.**

NIMS Thematic Workshop (2010: Incheon, Korea) Ed. by Habib Ammari et al. (Contemporary mathematics; v.548) American Mathematical Society, ©2011 163 p. \$69.00 (pa)

Drawn from papers delivered at the National Institute for Mathematical Sciences workshop on mathematical and statistical Methods for Imaging held in Incheon, Korea in August 2010, this collection of ten articles examines complex mathematics related to cutting edge digital imaging techniques. Topics discussed include resolution limits in source localization, path integrals and optical tomology, and attenuating acoustic media. Individual essays include abstracts, tables and formulas and are individually referenced. Author credentials are not provided.

QC763 2011-377864 978-3-527-40779-8

**Multifrequency electron paramagnetic resonance; theory and applications.**

Title main entry. Ed. by Sushil K. Misra.

Wiley-VCH, ©2011 1022 p. \$200.00

The introduction begins: "In earlier days, electron paramagnetic resonance (EPR) was referred to as paramagnetic resonance (PMR), but today is also referred to as electron spin resonance (ESR) and, more recently--in analogy with nuclear magnetic resonance (NMR)--as electron magnetic resonance (EMR)." Editor Misra (physics, Concordia U., Canada has

brought together contributed chapters offering full treatment of theoretical and practical aspects, and prospects for the future. Coverage includes both low and high frequency EPR, with emphasis on adopting the multi-frequency approach to study paramagnetic systems.

QC808 2011-377199 978-981-4293-74-7

**Statistical methods of geophysical data processing.**

Troian, Vladimir and Yurii Kiselev.

World Scientific, ©2010 436 p. \$138.00

Studying the structure of the Earth and near-earth space generates massive volumes of data, from which random error and noise can never be eliminated completely, say Troian and Kiselev (both St. Petersburg State U., Russia), so probability-statistical methods must be used to analyze and interpret the geophysical information. They explain such methods in a textbook based on a course of lectures they have given for graduate students of geophysics for the past decade. Among their topics are basic concepts of probability theory, models of measurement data, statistical criteria for choosing a model, and tomography methods for recovering the image of medium. Computer exercises are appended.

---

**CHEMISTRY**

---

QD96 2011-008524 978-0-12-386984-5

**Infrared and raman spectroscopy; principles and spectral interpretation.**

Larkin, Peter.

Elsevier, ©2011 228 p. \$115.00

Larkin has been using these and other imaging techniques for over 20 years to elucidate structure at specialty chemical and pharmaceutical companies. Infrared and Raman spectroscopy are completely complementary, providing characteristic fundamental vibrations that are extensively used to determine and identify molecular structure, he says, but are not widely used because potential users lack the necessary interpretation skills. It is that lacuna that he seeks to fill. His topics include basic principles, instruments and sampling methods, the origin of group frequencies, a general outline and strategies for interpretation, and unknown infrared and Raman spectra.

QD181 2011-377861 978-3-527-40859-7

**Anomalous effects in simple metals.**

Overhauser, Albert.

Wiley-VCH, ©2011 687 p. \$170.00

Over the past seven decades, many monographs and textbooks have elaborated the anticipated

electric, magnetic, optical, and thermal properties of a simple metal<-->one of the alkali metals that possesses free-electron-like conduction electrons, and so a spherical Fermi surface. Over the past four decades, experiments have consistently violated those expectations. Overhauser (physics, Purdue U., Indiana) documents the many phenomena that do not fit the theory, and compiles reports of research by him and his collaborators that has led to a unified synthesis of alkali metal peculiarities. Among the reprinted reports are mechanisms of anti-ferromagnetism in dilute alloys, the theory of the residual resistivity anomaly in potassium, open-orbit effects in thermal magnetoresistance, and broken symmetry in simple metals. No index is provided.

QD400 978-3-527-32706-5

**Heterocycles in natural products synthesis.**

Title main entry. Ed. by Krishna C. Majumdar and Shital K. Chattopadhyay.

*Wiley-VCH*, ©2011 637 p. \$210.00

This collection of sixteen articles on heterocyclic reactions highlights current research in the synthesis of natural products using heterocycles. Topics discussed include Aziridines in natural product synthesis, epoxides and oxetanes, furan, pyran, pyrrole and their derivatives, indoles and indolizidines, thiophene and other sulfur heterocycles and bioactive macrocyclic natural products. Chapters include numerous chemical formulas and equations. Contributors are chemists and materials scientists from universities and research facilities around the world.

QD415 2011-021605 978-1-4398-6076-2

**Introduction to natural products chemistry.**

Title main entry. Ed. by Rensheng Xu et al.

*CRC Press*, ©2012 363 p. \$89.95

The Chinese original was published in 2006 by the Science Press of China as part of a series introducing modern chemistry to scientists and graduate students. It compiles the most important results of natural products chemistry in China. The topics are extracting and isolating natural products, the chemistry of fungal products, alkaloids, sesquiterpenoids, diterpenes, saponins, amino acids and peptides, flavonoids, anthraquinones, coumarins, other natural bioactive compounds, marine natural products, the structural modification of active principles from traditional Chinese medicine, and the chemical synthesis of natural products.

QD501 978-3-527-32329-6

**Homogeneous catalysts; activity--stability--deactivation.**

Van Leeuwen, Piet W.N.M. and John C. Chadwick.

*Wiley-VCH*, ©2011 404 p. \$180.00

Although activation, deactivation, and regeneration of catalysts in heterogeneous catalysis has been a major area of study, and results have been published in accessible form, the same is not true for homogeneous catalysts. From the preface: "The approach in homogeneous catalysis is entirely different to that of heterogeneous catalysis, especially before industrial applications come into sight; in homogeneous catalysis, the general approach to improving the catalyst performance is variation of one of the catalytic components, without much attention being paid to the question of why other catalysis systems failed." This volume brings together research hitherto scattered in the literature. Piet van Leeuwen is based in Spain, and John Chadwick is based in The Netherlands; both are or have been affiliated with Shell Research.

QD505 978-3-527-32271-8

**Selective nanocatalysts and nanoscience; concepts for heterogeneous and homogeneous catalysis.**

Title main entry. Ed. by Adriano Zecchina et al.

*Wiley-VCH*, ©2011 332 p. \$215.00

While heterogeneous and homogeneous catalysis mainly followed separate development paths in the past, the recent work assembled here proves that they are strongly interconnected. The book describes several heterogeneous catalysts currently in use, then shows how nanoscience can be used with artificial homogeneous catalysts. Some chapter topics include the structure and reactivity of single and multiple sites on heterogeneous and homogeneous catalysts, the relationship between catalysis with transition metal complexes and catalysis by nanoparticles, synthetic catalysts of nanometric dimensions, and nanostructured photovoltaic materials for solar energy conversion. Chiral catalysts, selective catalysts for the petrochemical industry, and crystal engineering of metal-organic frameworks for heterogeneous catalysis are some other subjects considered. The book is for catalytic and organic chemists and those working in organometallics. Zecchina directs the Center for Excellence in Nanostructured Surfaces and Interfaces at the University of Torino.

QD569 2011-010949 978-0-470-40690-8  
**Catalysis in electrochemistry; from fundamental aspects to strategies for fuel cell development.**

Title main entry. Ed. by Elizabeth Santos and Wolfgang Schmickler. (Wiley series on electrocatalysis and electrochemistry; 3)

*John Wiley & Sons*, ©2011 516 p. \$135.00

Each volume in the series focuses on a particular aspects of electrocatalysis and electrochemistry, always with an eye out for commercial applications. The 14 studies here include discussions of the dynamics and stability of surface structures, the catalysis of electron transfer at metal electrodes, electrocatalysis at bimetallic surfaces obtained by surface decoration, carbon monoxide adsorption on platinum electrodes, electrocatalysis at liquid-liquid interfaces, and the impact of electrochemical science on energy problems.

QD801 978-1-4398-4206-5

**Handbook on applications of ultrasound; sonochemistry for sustainability.**

Title main entry. Ed. by Dong Chen et al.

*CRC Press*, ©2012 709 p. \$189.95

For chemists, Chen (engineering, Indiana U.-Purdue U. Fort Wayne) et al. compile 26 chapters on the use of ultrasound in industrial, agricultural, and environmental processes for better sustainability and to lower the number of hazardous chemicals and solvents, reduce energy consumption, and increase product selectivity. A global group of chemists, engineers, and other scientists discuss applications in medicine, drug and gene delivery, nanotechnology, food technology, polymer chemistry, anaerobic digestion, synthetic applications and organic chemistry, industrial syntheses and processes, environmental contaminants degradation, reactor design, electrochemical systems, and combined ultrasound-microwave technologies.

## BIOLOGY

QH324 978-1-907568-10-7

**Concepts and techniques in genomics and proteomics.**

Saraswathy, Nachimuthu and Ponnusamy Ramalingam. (Series on pharma, biotech and biosciences; v.10)

*Biohealthcare Publishing*, ©2011 242 p. \$115.00

The intent is a basic text for undergraduate and postgraduate students in biotechnology as well as researchers in other fields. Material is arranged in chapters beginning with a basic introduction to genes and genomes, discussion of the human genome project, model organisms, high capacity vectors, DNA

sequencing methods, genome mapping and sequencing methods, and genome sequence assembly and annotation. Following are chapters on functional genomics, proteomics, two-dimensional gel electrophoresis of proteins, mass spectrometry for proteomics, protein identification by peptide mass fingerprinting, protein sequencing techniques, phosphoproteomics, and glycoproteomics. Each chapter concludes with review questions and answers. The two authors are affiliated with Kumaraguru College of Technology, India. The volume is distributed in North America by BookMasters.

QH324 2010-052304 978-1-60960-557-5

**Feature selection and ensemble methods for bioinformatics; algorithmic classification and implementations.**

Okun, Oleg.

*Medical Information Science Reference*, ©2011 445 p. \$245.00

Okun (SMARTTECCO, Malmo, Sweden) offers a reference guide on machine learning aspects of one of the functions of bioinformatics, microarray gene expression-based cancer classification. The author notes that his book is unique in that it covers three topics that are not typically combined: machine learning, bioinformatics, and MATLAB. A sampling of topics includes gene expression data sets, extreme value-based gene selection, evolutionary algorithm for identifying predictive genes, ensembles of classifiers, and ensemble gene selection. The book also could be used as a textbook.

## ENGINEERING (GENERAL, CIVIL)

TA1 978-0-7277-4143-1

**The civil engineers; the story of the Institution of Civil Engineers and the people who made it.**

Ferguson, Hugh and Mike Chrimes.

*ICE Publishing*, ©2011 262 p. \$60.00

The Institution of Civil Engineers, UK, with which Ferguson and Chrimes have long been affiliated, is the oldest professional engineering institution. Drawing on its extensive archives, they present a well-illustrated history of civil engineering and leading role of ICE in the profession, from a meeting at a London coffee house in 1818 to such major modern projects as the Channel Tunnel and a global membership network. In landscape format, the volume includes color images of ICE presidents and secretaries, ICE buildings, project drawings, and a further reading list.

TA153 978-1-84569-398-5

**Service life estimation and extension of civil engineering structures.**

Title main entry. Ed. by Vistasp M. Karbhari and Luke S. Lee. (Woodhead Publishing in materials)

*Woodhead Publishing*, ©2011 301 p. \$210.00

Civil engineers discuss using fiber-reinforced polymer composites to rehabilitate and retrofit concrete structures, to extend the service life of corroded concrete structures, and rehabilitate and estimate the life of bridge superstructures. They also consider areas of uncertainty in using the material in such application. Then they survey techniques for estimating the service life of civil engineering structures from perspectives of probabilistic methods, non-destructive testing and evaluation, health monitoring and field validation, databases and knowledge-based systems, and pipeline rehabilitation systems.

TA166 978-0-415-67573-4

**Contemporary ergonomics and human factors 2011.**

Title main entry. Ed. by Martin Anderson.

*CRC Press*, ©2011 510 p. \$139.95 (pa)

This volume contains the proceedings of the April 2011 annual international conference of the Institute of Ergonomics & Human Factors in the UK. Seventy papers are presented in sections devoted to: human factors in industrial accidents, making safety culture work, ergonomics in education, designing transport systems for users and operators, usability of military equipment, human factors in modern manufacturing, ergonomics in future computer use, health care and aging, user centered design and evaluation of medical devices, green ergonomics, the 24 hour society, cross sectors, safety, human factors integration, and maps. Five posters are also included.

TA167 2010-038955 978-0-7546-7580-8

**The handbook of human-machine interaction; a human-centered design approach.**

Title main entry. Ed. by Guy A. Boy.

*Ashgate Publishing Co.*, ©2011 455 p. \$124.95

The field of human-machine interaction (HMI), as Boy (director, Human-Centered Design Institute, Florida Institute of Technology) describes it, "attempts to rationalize relevant attributes and categories that emerge from the use of (computerized) machines." It focuses on principles of safety, performance, comfort, and aesthetics in relation to human physical, cognitive, social,

and emotional factors. He presents 20 chapters that discuss approaches, methods, and tools for understanding HMI in the context of design and propose a human-centered design approach that is an upstream process that enables a design team to incorporate human requirements into the design of a system through the application of Boy's "AUTOS pyramid," relating the entities of Artifact (system), User, Task, and Organizational Environment. Twenty chapters discuss this system as well as other perspectives on human-machine interaction as they concern methods and tools for human-centered design and engineering. They are organized into sections on analysis, design and engineering, and evaluation.

TA169 2010-046368 978-0-470-92975-9

**Concise encyclopedia of system safety; definition of terms and concepts.**

Ericson, Clifton A.

*John Wiley & Sons*, ©2011 517 p. \$99.95

System safety is an engineering discipline that is applied during system design and development of a product or system in order to identify hazards and reduce the risk of accidents. System safety is used in fields such as commercial aircraft, nuclear power plants, weapon systems, and medical devices. This reference for system safety engineers, analysts, and managers begins with a definition of system safety and a rationale for its use and guidelines for when system safety should be applied, costs of system safety, and a history of the field. Alphabetical entries give definitions, explanations, and examples of system safety terms and concepts. Most entries are about a paragraph long, with some a full page and some only one sentence. There is also a section of the book reviewing system safety specialty areas; much of the information in this section is in outline format. The book includes b&w diagrams and tables and a list of acronyms. Ericson, editor of the *Journal of System Safety*, was president of the System Safety Society 2001-2003.

TA170 2011-007298 978-1-4129-9692-1

**Green technology; an A-to-Z guide.**

Title main entry. Ed. by Dustin Mulvaney. (The Sage reference series on green society; toward a sustainable future; 10)

*Sage Publications*, ©2011 524 p. \$110.00

This large reference encyclopedia provides detailed articles on a wide range of green technologies in several interest areas including renewable energy, non-polluting transportation, and sustainable building processes. Entries range from explanations of specific materials such as solar-voltaic cells, to conceptual



essays on topics such as the arms race or technological determinism. The volume includes a chronology of green technologies as well as a reader's guide that lists entries by topic groupings. Individual entries include illustrations and recommendations for further reading. The contributors are academics from American and European universities as well as independent scholars from a variety of disciplines.

TA350 978-3-03785-163-0

### **Coupled problems and multi-physics.**

Title main entry. Ed. by Moussa Karama. (Advanced materials research; v.274)

*Trans Tech Publications*, ©2011 121 p. \$124.00 (pa)

Containing only invited peer reviewed papers, this collection of twelve contributions on coupled problems and simulation of multi-physics issues contains frequent figures and equations. Although this area of research has traditionally been associated with aircraft engineering, several of the pieces cover other areas such as design optimization, drilling fluids, and river sedimentation.

TA355 2011-026782 978-1-4398-3455-8

### **Modeling and control in vibrational and structural dynamics; a differential geometric approach.**

Yao, Peng-fei. (Chapman & Hall/CRC applied mathematics and nonlinear science series)

*CRC Press*, ©2011 405 p. \$99.95

The differential geometrical approach was introduced more than a decade ago, says Yao (Chinese Academy of Science, Beijing), and since then there have been many developments in its use with vibrational and structural dynamics. He presents a systematic and up-to-date account, focusing on using the approach when the coefficients of the partial differential equations are variable in space, when the partial differential equations themselves are defined on curved surfaces, and when the systems have quasilinear principal parts. He includes the core material from the Chinese *Introduction to Riemannian Geometry* to make the book self-contained.

TA357 2011-018476978-1-84821-262-6

### **Statistical approach to wall turbulence.**

Tardu, Sedat.

*ISTE/Wiley*, ©2011 312 p. \$145.00

Writing primarily for master's and doctoral students, Tardu (Grenoble U., France) synthesizes the current knowledge about turbulence in flows bounded by solid barriers from a statistical perspective. He covers basic concepts; phenomenology, closure, and fine structure;

inner and outer scales: spectral behavior; effects based on Reynolds number; and vorticity.

TA417 978-3-03785-165-4

### **Dynamics of the structures and non destructive testing.**

Title main entry. Ed. by Moussa Karama. (Key engineering materials; v.482)

*Trans Tech Publications*, ©2011 100 p. \$124.00 (pa)

Destructive and non-destructive testing of composite and nano-composite materials, as well as refractory alloys, has become more important as their use has increased in structural engineering. The ten papers gathered here focus on the traditional topics of reliability and resistance to degradation, as well as newer topics such recyclability and biodegradability. Containing only invited peer reviewed papers, this collection of pieces contains frequent black and white photographs and figures. The spine and cover omit "the" from the title.

TA418 978-3-03785-159-3

### **Advances in structures analysis.**

Title main entry. Ed. by Moussa Karama. (Applied mechanics and materials; v.61)

*Trans Tech Publications*, ©2011 99 p. \$123.00 (pa)

Mechanical engineers, materials scientists, and others present 12 invited peer-reviewed papers on recent developments in analyzing the structural integrity of materials, components, and structures. Among their topics are optimizing by the reliability of the damage by tiredness of a wire rope of lifting, a multi-scale analysis of materials reinforced by inclusions randomly oriented in the ply plane, non-destructive testing methods applied to detect cracks in the hot section of a turbojet, and simulating the thermo-mechanical behavior of structures by the numerical resolution of the direct problem.

TA418 978-1-84569-513-2

### **Fracture and fatigue of welded joints and structures.**

Title main entry. Ed. by Kenneth A. Macdonald. (Woodhead Publishing in materials)

*Woodhead Publishing*, ©2011 338 p. \$230.00

Contributors in mechanics, materials, and construction explore aspects of current fracture and fatigue research that are important to general concepts of designing welded structures to avoid failure, and the ongoing assessment of the condition of structures and plants in service. Taking fracture and fatigue in turn, they consider such topics as test methods for

constraint fracture mechanics, using fracture mechanics in the fatigue analysis of welded joints, the fatigue strength assessment of local stresses in welded joints, improving weld class systems in assessing the fatigue life of different welded joint designs, fatigue assessment methods for variable amplitude loading of welded structures, and assessing residual stresses in predicting the service life of welded structures.

TA418 2011-015217 978-0-470-62607-8  
**Handbook of bioplastics and biocomposites engineering applications.**

Title main entry. Ed. by Srikanth Pilla.

*John Wiley & Sons*, ©2011 588 p. \$195.00

Responding to the impending depletion of cheap petroleum and the mountains of discarded plastic made from it, scientists have been exploring plastics that are made from biological sources and are biodegradable. Materials scientists and engineers here present an applications-oriented reference. They cover processing, and applications in packaging, civil engineering, biomedical engineering, and general engineering. Among specific topics are the handling of various forms of dry ingredients in bioplastics manufacturing and processing applications, polyvinyl-modified guar-gum bioplastics for packaging applications, starch as a biopolymer in construction and civil engineering, chitin and chitosan polymer nanofibrous membranes and their biological applications, and nanocomposites based on starch and fibers of natural origin.

TA418 2011-013472 978-0-470-48760-0  
**Hybrid nanomaterials; synthesis, characterization, and applications.**

Title main entry. Ed. by Bhanu P. S. Chauhan.

*John Wiley & Sons*, ©2011 334 p. \$115.00

Three dimensions of hybridity are considered in this volume: organic/inorganic components, heterogeneous/homogeneous catalysis, and hard and soft materials. Scientists and engineers in chemistry, materials, and pharmaceuticals who developed the materials discuss their discoveries and project future applications. Their topics include hybrids from polymer colloids and metallic nanoparticles as a novel type of green catalysis, the design and synthesis of nanohybrid systems based on a silicon-oxygen bond, nanocrystalline magnesium oxide for asymmetric organic reactions, biomedical multimodality in small solid core nanoparticles, liposomes containing polydiacetylene as sensory materials, and the block-copolymer-templated synthesis of ordered silicas with closed mesopores.

TA418 978-1-84569-670-2

**Nanostructured metals and alloys; processing, microstructure, mechanical properties and applications.**

Title main entry. Ed. by Sung H. Whang. (Woodhead Publishing in materials)

*Woodhead Publishing*, ©2011 803 p. \$305.00

Materials scientists offer a broad handbook on nanostructured metallic materials for structural applications. The topics include bulk nanostructured metals and alloys produced by accumulative roll-bonding, severe plastic deformation and producing nanostructured alloys by machining, deformation structures including twins in nanograined pure metals, characteristic structures and properties of nanostructured metals prepared by plastic deformation, strengthening mechanisms in nanocrystalline metals, the mechanical behavior of nanostructured metals based on molecular dynamics computer simulations, processing nanostructured metal and metal-matrix coatings by thermal and cold spraying, and applying nanostructured steel sheets to automotive body structures.

TA418 978-1-84569-761-7

**Polymer-carbon nanotube composites; preparation, properties and applications.**

Title main entry. Ed. by Tony McNally and Petra Pötschke. (Woodhead Publishing in materials)

*Woodhead Publishing*, ©2011 820 p. \$245.00

The composites have been well studied since the turn of the century, but until now there has been no single-volume comprehensive reference on making, analyzing, and using them. Taking the three steps in turn, materials scientists discuss such aspects as the surface treatment of carbon nanotubes with plasma technology, elastomer-carbon nanotube composites, mechanical properties of polymer-polymer-grafted carbon nanotube composites, the rheology of polymer-carbon nanotube composite melts, fibers, and biomedical and bioengineering applications.

TA418 978-3-03785-099-2

**Recent trends in materials and mechanical engineering materials, mechatronics and automation; 3v.**

International Conference on Recent Trends in Materials and Mechanical Engineering (2011: Shenzhen, China) Ed. by Qi Luo. (Applied mechanics and materials; vs.55-57)

*Trans Tech Publications*, ©2011 2265 p. \$552.00 (pa)

This three-volume set collects selected, peer-reviewed papers from a January 2011 conference held in Shenzhen, China. The conference

provided a forum for researchers, educators, engineers, and government officials involved in materials and mechanical engineering to disseminate research results and exchange views on future research directions. Volume 1 is dedicated to material engineering and mechanical engineering, with chapters on topics such as swelling and deswelling of a PH/thermosensitive hydrogel, techno-economic analysis of magnetic treatment of cobalt concrete, a plasticity model of extruded peanuts under mechanical pressing, and face image segmentation using a color information and saliency map. Volume 2 covers manufacturing and production processes, discussing areas such as design of a fiber-optic MEMs acoustic sensor system, a product life-cycle energy-consumption analysis method used in remanufacturing, and medical staff incentive mechanisms in China. Volume 3 describes automotive engineering and industry applications in areas such as trust analysis in social network community research, preparation and characterization of polypropylene/clay nanocomposites, and features extraction for printed numerals based on geometric properties.

TA418 2011-929804 978-1-84569-753-2

**Superplastic forming of advanced metallic materials; methods and applications.**

Title main entry. Ed. by Gillo Giuliano. (Woodhead Publishing in materials)

*Woodhead Publishing*, ©2011 369 p. \$230.00

Superplasticity is an exceptional ductility that some metals with fine and stable grain size display under deformation at specific temperatures and strain rates. The feature can be exploited to manufacture products with complex forms in a single operation. Here materials scientists and mechanical engineers, but also researchers in dentistry and automobiles, examine superplastic forming methods, modeling superplastic forming, and applications. Among specific topics are standards for the superplastic forming of metals, using laser surface modification in combined superplastic forming and diffusion bonding of metals, the finite element modeling of thin metal sheet forming, predicting instability in the superplastic forming of metals, superplastic forming and diffusion bonding of titanium alloys, and superplastic micro-tubes fabricated by dieless drawing processes.

TA418 978-1-84569-658-0

**Thermal barrier coatings.**

Title main entry. Ed. by Huibin Xu and Hongbo Guo. (Woodhead Publishing in materials)

*Woodhead Publishing*, ©2011 339 p. \$230.00

Materials scientists and mechanical engineers explain how the coatings, along with internal cooling of superalloy components, can allow aircraft and industrial engines to operate at a temperature above the melting point of the superalloy. They cover materials and structure, processing and spraying techniques, and the performance of thermal barrier coatings. Specific topics include ceramic thermal barrier coating materials, nanostructured coatings, manufacturing thermal barrier coatings by electron beam physical vapor deposition, plasma-sprayed thermal barrier coatings with segmentation cracks, the non-destructive evaluation of failure, and life prediction.

TA418 2011-932611 978-1-84569-736-5

**Thin film growth; physics, materials science and applications.**

Title main entry. Ed. by Zexian Cao. (Woodhead Publishing in materials)

*Woodhead Publishing*, ©2011 416 p. \$245.00

Physicists, materials scientists, and engineers offer perspectives on the theory and techniques of thin film growth. Their topics include measuring nucleation and growth processes, analyzing the evolution of surface roughness, modeling thin film deposition processes based on real-time observation, phase transition in colloidal crystal thin films, thin film growth for thermally unstable noble-metal nitrides by reactive magnetron sputtering, electronic properties and adsorption behavior of thin films with polar character, understanding substrate plasticity and buckling of thin films, the electrocaloric effect in ferroelectric polymer films, and network behavior in thin films and nanostructure growth dynamics.

TA418.9 978-1-4398-4176-1

**Computational nanotechnology modeling and applications with MATLAB.**

Title main entry. Ed. by Sarhan M. Musa. (Nano and energy series)

*CRC Press*, ©2012 513 p. \$139.95

Electronic and computer engineers, chemists, and other contributors explore some of the computational aspects of manipulating materials on the nanometer scale. Their topics include the computational modeling of nanoparticles, a numerical integrator for continuum equations of surface growth and erosion, computational and

experimental approaches to cellular and subcellular tracking at the nanoscale, modeling reversible protein conjugation on a nanoscale surface, and computational technology in nanomedicine.

TA658 2011-377213 978-1-84816-477-2

**Optimization and anti-optimization of structures under uncertainty.**

Elishakoff, Isaac and Makoto Ohsaki.

*Imperial College Press*, ©2010 402 p. \$127.00

Mechanical engineers Elishakoff (Florida Atlantic U.) and Ohsaki (Kyoto U.) explore approaches to design that incorporate or avoid optimization under unknown-but-bounded uncertainty. They cover optimization as making the best in the presence of certainty/uncertainty; a general formulation of anti-optimization; anti-optimization in static problems, buckling, and vibration; anti-optimization through interval analysis based on the finite-element method; anti-optimization and probabilistic design; and hybrid optimization and anti-optimization under uncertainty or making the best out of the worst. Distributed in the US by World Scientific Publishing.

TA706 2011-379778 978-0-7277-4083-0

**Rock engineering.**

Palmström, Arild and Hakan Stille.

*Thomas Telford*, ©2010 408 p. \$130.00

Palmström, with a Norwegian company, and Stille (Royal Institute of Technology, Sweden) provide descriptions of rockmasses, with illustrations, in order to strengthen the link between engineering geology<-->which collects characteristics of the site condition<-->and rock mechanics<-->which collects relevant and sufficient information on the ground then selects appropriate rock engineering tools to design the tunnel or other opening being planned. They do not cover all aspects and details, but focus on the interaction between engineering geology and rock design rather than on excavation methods. They assume readers are experienced in underground rock excavations as engineering geologists, rock engineers, excavators, or graduate students in these fields.

TA1230 2011-020212 978-1-84821-279-4

**Human-computer interactions in transport.**

Title main entry. Ed. by Christophe Kolski.

*ISTE/Wiley*, ©2011 375 p. \$145.00

This collection of eleven articles on human computer interaction highlights current research in integrated computing systems for both public and personal transportation. Topics discussed include traveler information systems

for urban subway and bus systems, user needs analysis methodologies, personalized interactive systems, human-machine co-operation in automotive copilot systems, hands-free multimedia control processes and travel time and its computing potential. Individual chapters include illustrations, tables and black and white photographs. The contributors are French, Algerian and American academics in computer science and engineering fields.

---

## ENVIRONMENTAL TECHNOLOGY

---

TD887 2011-013242 978-0-89448-043-0

**Transport and removal of aerosols in nuclear power plants following severe accidents.**

Sher, Rudolph and Richard R. Hobbins.

*American Nuclear Society*, ©2011 218 p. \$70.00

This volume provides a summary of the physical, chemical, and thermodynamic phenomena taking place in nuclear reactor cores during the progression of reactor accidents; the formation and physical and chemical properties of the resulting radioactive aerosols; the timing and duration of the aerosol release from the core to the coolant system and containment; and the physical, chemical, and thermal-hydraulic phenomena that govern the removal of aerosols within the containment or other plant volumes through natural or engineered processes. The emphasis is on light water reactors, although much of the material has wider applicability.

TD898 978-1-84569-626-9

**Handbook of advanced radioactive waste conditioning technologies.**

Title main entry. Ed. by Michael I. Ojovan. (Woodhead Publishing series in energy; no.12)

*Woodhead Publishing*, ©2011 488 p. \$265.00

Materials scientists, chemists, and power engineers explore some current and possible avenues for dealing with the radioactive waste that nuclear power plants produce. They cover characterizing radioactive waste and selecting processing technologies, compaction, incineration and plasma processes, inorganic cements to condition and immobilize waste, calcination and vitrification, the historical development of glass and ceramic forms for high-level radioactive wastes, generating and managing radioactive and other wastes while decommissioning nuclear facilities and environmental remediation, geopolymers, glass matrices, ceramic matrices, the French experience



with waste packages, metal containers, the failure of storage mechanisms, long-term behavior models, and knowledge management for radioactive waste management organizations.

TD899 2010-029540 978-0-8247-9106-3

**Remediation of former manufactured gas plants and other coal-tar sites.**

Hatheway, Allen W.

*CRC Press*, ©2012 1354 p. \$199.95

This book constitutes an extraordinary resource for industry professionals concerned with clean-up, which is crucial to sustaining the environment. Hatheway had an active career in many capacities, then retired early after a couple decades teaching geological engineering at the School of Mines and Metallurgy of the U. of Missouri-Rolla; but he didn't just go fishing. Instead, having long been frustrated by the lack of "definitive answers to real questions about site and waste characterization and remedial engineering of manufactured gas plants" (his words, from the introduction), he devoted 13 years to visiting and studying more than 900 coal-tar sites in North America and Britain. He methodically compiled information, and the result is this hefty volume that will no doubt serve as an indispensable reference for years to come. Coverage is encyclopedic, encompassing the history of manufactured gas and coal-tar activities, details of manufacturing processes, sources and mechanisms (and choices) responsible for site contamination, and details of the remediation process.

TG300 978-0-415-68415-6

**Modern techniques in bridge engineering.**

Title main entry. Ed. by Khaled M. Mahmoud.

*CRC Press*, ©2011 323 p. \$159.95

Increasing traffic loads, deterioration of bridges, and the need to maintain bridges without disrupting vital economic and social activities were some of the issues addressed at the Sixth New York Bridge Conference, in July 2011. In 26 papers selected from the presentations there, bridge engineering practitioners, researchers, owners, and contractors from all over the world look at cable-supported bridges, bridge analysis and design, innovative bridge technology, bridge rehabilitation and retrofit, bridge replacement and construction, bridge management and monitoring, and historic bridges. Among the topics are the cable-stayed bridge across the River Sava in Belgrade, incorporating climate change predictions in the hydraulic analysis of bridges, new tools for inspecting gusset

plates, deck truss bearing rehabilitation for the Benjamin Franklin Bridge, the rapid replacement of bridges using modular systems, identifying and sharing best practices in bridge maintenance and management, and examining the forms of Hudson River bridges. Only authors are indexed.

---

**MECHANICAL ENGINEERING & MACHINERY**

---

TJ163 2011-025620 978-0-07-174552-9

**Handbook of energy engineering calculations.**

Hicks, Tyler G.

*McGraw-Hill*, ©2012 736 p. \$125.00

Some 2,500 calculations procedures in energy engineering are presented in both the US customary system (USCS) and the System International (SI) so that engineers and designers worldwide will find familiar units for each calculation. Some of the calculations are unique, provided by the team of contributors, and some come from published sources. Most of the chapters focus on a particular energy source, such as steam, gas-turbine, nuclear, wind, solar, and ocean. Other topics include energy conversion, internal-combustion engine energy analysis, heat transfer and energy conservation, fluid transfer, interior climate control energy economics, and energy conservation and environmental pollution control. A detailed index allows access to particular calculations.

TJ211 978-90-5850-651-1

**Technologies on the stand; legal and ethical questions in neuroscience and robotics.**

Title main entry. Ed. by Bibi van den Berg and Laura Klaming.

*Wolf Legal Publishers*, ©2011 422 p. \$45.00 (pa)

This volume originates out of an eponymous April 2011 conference held at Tilburg U., the Netherlands. It contains 19 papers dealing with a range of topics from the fields of law and ethics as they relate to neuroscience, on the one hand, and robotics on the other. Broadly speaking, topics addressing law, ethics, and neuroscience include the role of neuroscience in assessing the responsibility of a suspect in a criminal trial, legal issues raised by using neuroscience in the courtroom, and the question of using neuroscience for enhancement and related legal and ethical issues. Topics associated with the fields of law, ethics, and robotics include foundations of roboethics, ethics and the design of robots (including the implementation of ethics

or morality in robots), and legal issues in robotics.

TJ755 978-1-84569-715-0

**Diesel engine system design.**

Xin, Qianfan. (Woodhead Publishing in mechanical engineering)

Woodhead Publishing, ©2011 1038 p. \$330.00

The subject is becoming increasingly important because of the diesel engine's potential for superior fuel efficiency and reliability. It's also complex and multifaceted, involving many people. Xin works in private industry as a specialist in diesel engine system design, and one reason he wrote this text is to mitigate the disconnect between academic experiences and the work place. Another reason was the need for a comprehensive reference that gathers information scattered in the literature of company reports, journals, and even the oral accounts of engineers. The author also wanted to present a unified and systematic theory about diesel engine system design that would be useful to people in various areas of the organization and would facilitate collaboration. This volume begins with an extensive listing and decoding of nomenclature and of abbreviations and acronyms. Coverage begins with fundamental concepts and continues with the engine thermodynamic cycle and vehicle powertrain performance; dynamics, friction, and noise, vibration and harshness; and heat rejection, air system engine controls, and system integration.

---

**ELECTRICAL ENGINEERING,  
ELECTRONICS, NUCLEAR ENGINEERING**

---

TK152 2011-286400 978-0-470-62589-7

**Handbook of international electrical safety practices.**

Title main entry. Ed. by Princeton Energy Resources International.

John Wiley & Sons, ©2010 721 p. \$195.00

This reference edited by Princeton Energy Resources International (PERI) is intended for the electricity generation, power transmission, and distribution sectors of the energy industry. It is a collection of best international practices for safe handling operations and is intended as a desk reference for technicians, engineers, supervisors, line personnel, business managers, and other industry professionals. It covers a wide range of topics concerning physical, chemical, thermal, energizing, and other hazards that might be confronted in transmission systems and energizing sources<-->and provides information on evaluating and developing

site-specific safety and health programs. More than a rehashing of regulations and laws, the handbook offers a functional framework for creating a safe industrial environment. Eight PERI staff members contributed to the book. While technical, the book is clearly written and well-formatted for quick reference.

TK1541 2010-045226 978-0-470-59365-3

**Power conversion and control of wind energy systems.**

Title main entry. Ed. by Bin Wu et al. (IEEE Press series on power engineering; 74)

Wiley-IEEE Press, ©2011 453 p. \$110.00

For academic researchers, practicing engineers, consultants, and undergraduate and advanced graduate students, Wu (electrical and computer engineering, Ryerson U., Canada) et al. explore the power conversion and control of wind energy conversion systems (WECS) from an electrical engineering perspective, analyzing wind generators, system configurations, power convertors, control schemes, and dynamic/steady-state performance of various practical systems. They discuss market survey, wind turbine technology, system classifications, costs, and grid codes for wind power integration; the fundamentals of systems; commonly used generators; and various power convertors and characteristics of major WECS, including fixed-speed induction generators, variable-speed squirrel cage induction generators, doubly fed induction generators, and synchronous generator based systems. Case studies and solved problems are provided.

TK3001 2011-003205 978-1-84821-245-9

**Electrical distribution networks.**

Title main entry. Ed. by Nouredine Hadjsaid and Jean-Claude Sabonnadière.

ISTE/Wiley, ©2011 492 p. \$195.00

Traditional electricity distribution networks are ill-equipped to meet the challenges of a new generation of sustainable and renewable power now mandated by many governments and demanded by citizens. They were simply not designed to handle decentralized energy production from randomly located and intermittent energy sources like wind, solar, geothermal, and others. This book offers a comprehensive and thorough exploration of both theoretical and practical tools needed for a new "intelligent energy network," typically referred to as a smart grid. Topics include overviews of distribution networks and decentralized energy production, impacts of distributed generation on the electrical network, photovoltaic and wind turbine systems

and grid integration, reliability, load control, fault detection and protection, power electronics, and virtual power systems for active networks. The book should particularly interest researchers and engineers involved in the development of the new, more flexible and reliable distribution system of the future. Editors Hadjsaid (director, IDEA, France), Sabonnadière (emeritus, National Polytechnic Institute of Grenoble, France), and 26 authors contributed to the book.

TK5102 2011-003217 978-1-61520-925-5

**Signal processing, perceptual coding, and watermarking of digital audio; advanced technologies and models.**

He, Xing.

*Information Science Reference*, ©2012 192 p. \$195.00

He (SRS Labs) proposes a psychoacoustic model for digital perceptual audio coding and digital audio watermarking. The model takes advantage of the flexibility of discrete wavelet packet transform (DWPT) decomposition to closely approximate the critical bands and allows precise masking thresholds, resulting in increased inaudible spectrum and reduction of sum to signal masking ratio (SSMR). The final chapter presents a fast and robust synchronization algorithm for watermarking which exploits the consistency of the signal energy distribution under varying transformation conditions and uses matched filter detection to determine the precise watermark location.

TK5103 2010-022641 978-1-4200-8812-0

**Mobile opportunistic networks; architectures, protocols and applications.**

Title main entry. Ed. by Mieso K. Denko.

*CRC Press*, ©2011 278 p. \$119.95

Denko (deceased, computing and information science, U. of Guelph, Canada) and is co-authors provide an overview of current research findings, technologies, tools, and innovations in mobile opportunistic networks, said to be one of the most promising technologies for the next generation of mobile technologies. Topics include the state of the art in modeling mobile opportunistic networks, opportunistic routing for load balancing and reliable data dissemination, quality of service, effective file transfer, and connection enhancement. The book should be considered a technical guide for engineer, scientists, practitioners, graduate students, and researchers.

TK5105 2011-007852 978-0-470-74915-9

**Cooperative networking.**

Title main entry. Ed. by Mohammad Obaidat and Sudip Misra.

*John Wiley & Sons*, ©2011 330 p. \$125.00

This collection of fourteen articles on cooperative networking showcases current scholarship in the interaction of telecommunications networks through a wide variety of emerging technologies such as ad hoc, peer-to-peer, and sensor networks. Topics discussed include cooperation in autonomous vehicular networks, cooperation in wireless ad hoc and sensor networks, overlay networking for streaming multimedia content, access selection in ambient networks and cooperative caching for chip multiprocessors. Individual papers include illustrations, diagrams and formulas. The contributors are computer scientists and telecommunications engineers from universities and research firms around the world.

TK5105 2011-006282 978-1-58714-127-0

**Enterprise network testing.**

Sholomon, Andy and Tom Kunath.

*Cisco Press*, ©2011 599 p. \$65.00

Network consulting engineer Sholomon and solutions architect Kunath, both with Cisco, explain structured system testing to network professionals, and how to use it to test complex network systems and technologies. The book could be read cover-to-cover, they say, but it is intended mostly as a reference that readers skip around in to find information relevant to a particular project or problem. Among their topics are testing and laboratory strategy development, proof of concept testing case study, migration plan testing cast study, a plan to test the firewall in an inter-organization secure data center interconnection, IPv6 functionality test plan, and using the laboratory for hands-on technology training.

TK5105 2011-017832 978-1-60960-794-4

**Performance and dependability in service computing; concepts, techniques and research directions.**

Title main entry. Ed. by Valeria Cardellini et al.

*Information Science Reference*, ©2012 477 p. \$195.00

Computer scientists from many parts of the world describe recent efforts and achievements in overcoming problems and limitation associated with the service-oriented computing paradigm. Their topics include dependability modeling, service-oriented collaborative business processes, the performance management of composite applications in service-oriented architectures, a

game-theory solution for the optimal selection of services, the performability evaluation of web-based services, building web services with time requirements, engineering secure web services, and detecting vulnerabilities in web services.

TK5105 2011-010645 978-0-12-385965-5  
**Semantic web for the working ontologist; effective modeling in RDFS and OWL, 2d ed.**

Allemang, Dean and Jim Hendler.

*Morgan Kaufmann Pub., Inc.*, ©2012 354 p. \$54.95 (pa)

Allemang, a scientist at a company that consults, trains, and provides products for the Semantic Web, and Hendler (computer and cognitive science, Rensselaer Polytechnic Institute) explain how web developers who are practitioners in another field, such as health care, finance, engineering, national intelligence, and enterprise architecture, can model data to fit the requirements of the Semantic Web. They detail how to construct semantic models, with a focus on the use of RDF (Resource Description Framework), RDFS (RDF schema), and OWL (Web Ontology Language) to accomplish specific tasks and model data and domains. This edition has been updated to incorporate new technologies such as SPARQL (SPARQL Protocol And RDF Query Language), OWL 2.0, and SKOS (Simple Knowledge Organization System). They include examples of Quantities, Units, Dimensions, and Types (QUDT) and The Open Biological and Biomedical Ontologies (OBO), as well as examples of how to use the Semantic Web to solve common modeling problems and a FAQ section on challenges.

TK7870 2011-927290 978-1-84569-576-7  
**Advanced adhesives in electronics; materials, properties and applications.**

Title main entry. Ed. by M.O. Alam and C. Bailey.  
 (Woodhead Publishing in materials)

*Woodhead Publishing*, ©2011 268 p. \$210.00

Eight studies describe types of adhesives used in electronic devices and their processing and properties. Researchers in mathematics, computing, and electronics discuss such topics as anisotropic conductive adhesives in electronics, underfill adhesive materials for flip chip applications, the structural integrity of metal-polymer adhesive interfaces in microelectronics, modeling techniques used to assess conductive adhesive properties, and adhesive technology for photonics.

TK7871 2011-021212 978-1-84821-307-4  
**Compact antennas for wireless communications and terminals; theory and design.**

Title main entry. Ed. by Jean-Marc Laheurte.

*ISTE/Wiley*, ©2011 245 p. \$125.00

Specialist engineers and researchers examine microwave antennas and more specifically planar versions, which are the types of antenna preferred at microwave frequencies in modern integrated communication systems. They explain the principles of planar and/or small volume antennas, problems of design and manufacture, and constraints and limitations presented by the antenna within the body of the communication system. Among specific topics are the transmission line model, electrical equivalent circuit of a printed antenna, circularly polarized antennas, and reconfigurable antennas.

TK7871 978-1-60807-143-2

**Plasma antennas.**

Anderson, Theodore. (Artech House antennas and propagation series)

*Artech House*, ©2011 203 p. \$109.00

Anderson (founder, CEO, and principal investigator for Haleakala Research and Development, Inc.) presents comprehensive coverage of the emerging technology of plasma antennas. Plasma antennas utilize ionized gas as a conductor rather than metal resulting in a highly efficient and adaptable antenna. Topics discussed include plasma antenna physics, fundamental theory, building a basic plasma antenna, nesting, stacking, arrays, reduction of cosite interference, plasma antenna windowing, plasma frequency selective surfaces, plasma antenna thermal noise, and more. With a section covering basic plasma physics, this book is a useful resource for students and professionals alike.

TK7871 2011-286648 978-1-84816-491-8  
**Ultrawideband antennas; design and applications.**

Title main entry. Ed. by Daniel Valderas et al.

*Imperial College Press*, ©2011 194 p. \$90.00

Now that unlicensed commercial ultrawideband systems are legal and proliferating, Spanish and Chinese electrical engineers describe aspects of designing antennas to pick up the signals in a range of particular applications. Their topics include monopole antenna analysis, bandwidth synthesis and maximization, folded monopole antennas, revolution monopole antennas, and printed circuit monopoles. Among the applications are communications, measuring electromagnetic waves, detecting breast cancer, and radar. Distributed in the US by World Scientific.



TK7875 2011-009635 978-0-470-97869-6

**Digital holography for MEMS and microsystem metrology.**

Title main entry. Ed. by Anand Asundi.

(Microsystem and nanotechnology)

*John Wiley & Sons*, ©2011 205 p. \$110.00

Indian and Chinese engineers, most of them working in optics or optoelectronics, explore issues related to micro-measurement with a specific focus on micro-devices and micro-electro-mechanical systems (MEMS) for which digital holography is best suited. They cover digital reflection holography and applications, digital transmission holography and applications, digital in-line holography and applications, and other applications.

---

**MOTOR VEHICLES, AERONAUTICS, ASTRONAUTICS**

---

TL221 2011-002521 978-0-470-74773-5

**Hybrid electric vehicles; principles and applications with practical perspectives.**

Mi, Chris et al.

*John Wiley & Sons*, ©2011 448 p. \$110.00

Hybrid electric and all-electric vehicles have slowly been catching on as the transportation of choice for consumers interested in better fuel economy and a smaller carbon footprint. And, as automakers and engineers know, electric vehicle technologies have been multiplying rapidly. This book may be differentiated from others on the topic in that the authors wanted to widen the focus to include other forms of transportation, like locomotives, construction and mining vehicles, and ships. Topics include an introduction to sustainable transportation, the state of the art for all manner of electric vehicles, fundamentals of electrics and their power trains, power electronics, batteries and ultracapacitors, component size and design optimization, power control strategy, and energy management. Authors are Mi (electrical and computer engineering, U. of Michigan), Masrur (advanced electric and hybrid vehicles, U. of Detroit Mercy), and Gao (electrical and computer engineering, U. of Denver). The book is intended for graduate students and field engineers as a textbook or for self-study.

TL501 2011-005628 978-0-470-74133-7

**System health management; with aerospace applications.**

Title main entry. Ed. by Stephen B Johnson et al.

*John Wiley & Sons*, ©2011 630 p. \$210.00

From the foreword: "As a systems engineering discipline, SHM addresses the

design, development, operation, and lifecycle management of components, subsystems, vehicles, and other operational systems with the purpose of maintaining nominal system behavior and function and assuring mission safety and effectiveness under off-nominal conditions." SHM concepts apply to consumer products (cars, computers), but the roots of the discipline are in aerospace applications where conditions are extreme or hazardous. From the preface: "This book is predicated on the idea that SHM has been evolving into its own discipline over the course of the last 20 years, and has reached 'critical mass.' The intent of this book is to provide a basic resource for those who work in, or interact with it." The seven editors who participated in assembling this handbook have affiliations with NASA, academia, and private enterprise.

TL671 978-0-415-66574-2

**Aircraft structures.**

Narasaiah, G. Lakshmi.

*Routledge*, ©2011 401 p. \$129.95

Narasaiah (the Institute of Aeronautical Engineering) presents this book covering the basics of aircraft design. The book is organized into three sections, the first covering the basics of structural analysis, the second dealing with design and analysis of aeroplane structures, and the third offering information on additional topics. Each section covers its respective subjects thoroughly including many examples and a wealth of equations, graphs, charts, and statistics. This text is a highly valuable resource for students and professionals in aircraft engineering.

TL1491 978-1-60086-836-8

**Spacecraft charging.**

Title main entry. Ed. by Shu T. Lai. (Progress in astronautics and aeronautics; v.237)

*Amer. Inst. of Aeronautics & Astronautics*, ©2011 179 p. \$84.95

Scientists in the US, Japan, and Europe examine some of the dangers spacecraft face from near-Earth space weather when they recharge their batteries. They cover surface and deep dielectric charging on spacecraft; incoming and outgoing electrons; spacecraft charging, arcing, and sustained arcs in low Earth orbit, surface discharge on spacecraft, spacecraft charging simulation, spacecraft charging in the auroral oval, and internal charging.

---

**CHEMICAL TECHNOLOGY**


---

TP159 2011934921 978-1-84569-969-7

**Advanced membrane science and technology for sustainable energy and environmental applications.**

Title main entry. Ed. by Angelo Basile and Suzana Pereira Nunes. (Woodhead Publishing series in energy no.25)

*Woodhead Publishing*, ©2011 818 p. \$330.00

Scientists and engineers in materials, chemistry, and other fields who specialize in membrane science and technology describe applications of membranes that help reduce greenhouse gas emissions and contribute to energy security. After introducing membrane science and engineering, they survey applications for carbon dioxide capture and synthetic gas processing and oxygen transport in coal and gas power plants; hydrocarbon fuel and natural gas processing and advanced biofuels production in the petrochemical industry; batteries, fuel cells, and hydrogen production for alternative energy applications; and industrial, environmental, and nuclear applications. Among specific topics are the fundamental science of gas and vapor separation in polymeric membranes, inorganic membranes for pre-combustion carbon dioxide capture, membranes for hydrocarbon processing and separation, ion exchange membranes for vanadium redox flow batteries, and the degradation of polymeric membranes in water and wastewater treatment. Angelo Basile and Suzana Pereira Nunes are based at Penn State University.

---

**MANUFACTURES, ARTS & CRAFTS**


---

TS173 2011-011401 978-1-60960-747-0

**Dependability and computer engineering; concepts for software-intensive systems.**

Title main entry. Ed. by Luigia Petre et al.

*Engineering Science Reference*, ©2012 515 p. \$195.00

This reference provides an overview of current research being conducted on the dependability of software-intensive systems, and addresses the most pressing challenges to ensuring that dependability. Some specific topic examples include: a holistic approach to fault management, network availability for distributed applications, development of scalable and reliable multi-agent systems, security issues and software vulnerabilities, application security for mobile devices, and analysis of risks and dependability. The book was written

for readers interested in the design, operation, maintenance, and management of dependable software-intensive systems. Editors Petre, Sere, Troubitsyana (Abo Akademi U., Finland) and 47 co-authors contributed to the reference.

UG486 2011-010940 978-0-470-25560-5

**Military laser technology for defense; technology for revolutionizing 21st century warfare.**

McAulay, Alastair D.

*John Wiley & Sons*, ©2011 305 p. \$79.95

McAulay (electrical and computer engineering, Lehigh U.) presents unclassified and declassified information on military applications of laser technology that involves the propagation of laser beams through the atmosphere. Following background information on optical technologies, he describes specific laser technologies, including efficient ultrahigh-power lasers such as the free-electron laser that he believes will have a major impact on future warfare. He then discusses protection from directed energy lasers and the role of laser technologies in combating missiles, nuclear weapons, and chemical-biological weapons; in object detection, tracking, and identification; and in various anti-terrorism applications (for some reason "nonlethal crowd control" is included under the rubric of anti-terrorism).

UG635 2011-008727 978-1-59114-241-6

**Chinese aerospace power; evolving maritime roles.**

Title main entry. Ed. by Andrew S. Erickson and Lyle J. Goldstein.

*Naval Institute Press*, ©2011 524 p. \$52.95

This work offers a broad overview and appraisal of recent developments in Chinese aerospace and maritime power and examines implications for the US military, especially Chinese prowess in fielding advanced cruise missiles and China's long-range precision-strike capabilities that pose a threat to forces in the Western Pacific theater; emphasis is on how the US can deter armed conflict with China and maintain a dominant presence in the region. Coverage encompasses China's existing aerospace system of microsatellites, unmanned aerial vehicles, ballistic and cruise missiles, as well as China's aircraft carrier program now under development. The book surveys Chinese aerospace assets for intelligence, surveillance, and reconnaissance (ISR) and counter-ISR, and considers prospective maritime missions that might develop further in the future as the result of advances in Chinese aerospace. B&W maps are included. The book

consists of revised and updated papers from a December 2008 conference sponsored by the US Naval War College's China Maritime Studies Institute, plus invited new papers, written by technical specialists in the US Air Force, US Navy operators, and regional experts. The editors are affiliated with the College's China Maritime Studies Institute.

VM156 2010-054228 978-1-119-99149-6

**Handbook of marine craft hydrodynamics and motion control.**

Fossen, Thor I.

*John Wiley & Sons*, ©2011 575 p. \$195.00

Fossen (Norwegian U. of Science and Technology, Norway) has developed expertise in the fields of hydrodynamics, naval architecture, robotics, marine and flight control systems, guidance systems, navigation systems, and nonlinear control theory. In this handbook he has merged recent research and results with material from two previous texts (*Guidance and Control of Ocean Vehicles*, 1994; and *Marine Control Systems*, 2002). Coverage encompasses kinematics; rigid-body kinetics; hydrostatics; seakeeping theory; maneuvering theory; models for ships, offshore structures, and underwater vehicles; environmental forces and moments; and various aspects of motion control including guidance systems and sensor and navigations systems. Appendices include nonlinear stability theory, and numerical methods.

---

**PUBLISHING, LIBRARY SCIENCE, BIBLIOGRAPHY**

---

Z675 978-1-84334-616-6

**Convergence of libraries and technology organizations; new information support models.**

Barth, Christopher D. (Information professional series)

*Chandos Publishing*, ©2011 180 p. \$80.00 (pa)

Some organizations and institutions have converged their previously independent library and technology teams into single information

teams, creating a new type of organization: the information service organization. This book is designed to support institutions that are considering or already deploying a converged information service model, principally in academic settings. The book doesn't provide an exact blueprint of how the process should be done, but rather promotes discussion among campus and organizational leaders as well as library and technology staff, and gives guidelines for organizational design in converged organizations. Material is presented from the point of view of the library. The book looks at changes in professional identity, staffing for convergence, and the tension between traditional models of specialization in higher education versus the generalization needs of converged organizations. A final chapter examines future trends in the research process, the cloud, multimedia, metadata, and user interfaces. Barth is executive director of library and information services at Luther College. The book is distributed in North America by Neal-Schuman.

Z678 2011-010418 978-1-59884-573-0

**Engaging in evaluation and assessment research.**

Hernon, Peter et al.

*Libraries Unlimited*, ©2011 305 p. \$50.00 (pa)

Hernon (library and information science, Simmons College) et al. introduce evaluation and assessment research to library managers and students and its use in planning, decision making, and accountability to improve the quality of library programs and services or its infrastructure. Drawing from research within and outside library and information science, they overview the research process and its activities, including reflective inquiry, adoption of appropriate procedures, quantitative and qualitative data collection and analysis, and presenting findings. They explain design, statistics, and creating a culture of evidence gathering and managerial use, and offer a checklist of tips drawn from their and others' experiences. ❖